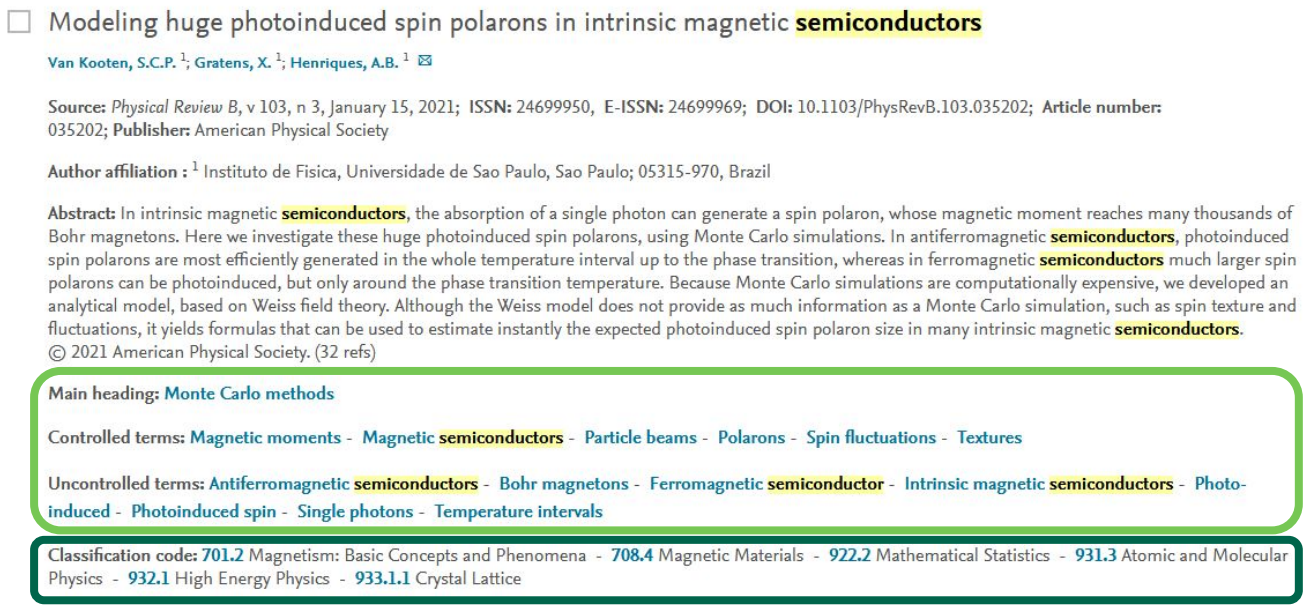
Engineering Village (Compendex)

To find relevant subject headings for a topic, start with a keyword search and click on a result that pertains to your topic. The Subject Headings are listed below the abstract.



Modeling huge photoinduced spin polarons in intrinsic magnetic **semiconductors**

Van Kooten, S.C.P. [1]; Gratens, X. [1]; Henriques, A.B. [1]

Source: *Physical Review B*, v 103, n 3, January 15, 2021; **ISSN:** 24699950, **E-ISSN:** 24699969; **DOI:** 10.1103/PhysRevB.103.035202; **Article number:** 035202; **Publisher:** American Physical Society

Author affiliation : [1] Instituto de Fisica, Universidade de Sao Paulo, Sao Paulo; 05315-970, Brazil

Abstract: In intrinsic magnetic **semiconductors**, the absorption of a single photon can generate a spin polaron, whose magnetic moment reaches many thousands of Bohr magnetons. Here we investigate these huge photoinduced spin polarons, using Monte Carlo simulations. In antiferromagnetic **semiconductors**, photoinduced spin polarons are most efficiently generated in the whole temperature interval up to the phase transition, whereas in ferromagnetic **semiconductors** much larger spin polarons can be photoinduced, but only around the phase transition temperature. Because Monte Carlo simulations are computationally expensive, we developed an analytical model, based on Weiss field theory. Although the Weiss model does not provide as much information as a Monte Carlo simulation, such as spin texture and fluctuations, it yields formulas that can be used to estimate instantly the expected photoinduced spin polaron size in many intrinsic magnetic **semiconductors**.
© 2021 American Physical Society. (32 refs)

Main heading: Monte Carlo methods

Controlled terms: Magnetic moments - Magnetic **semiconductors** - Particle beams - Polarons - Spin fluctuations - Textures

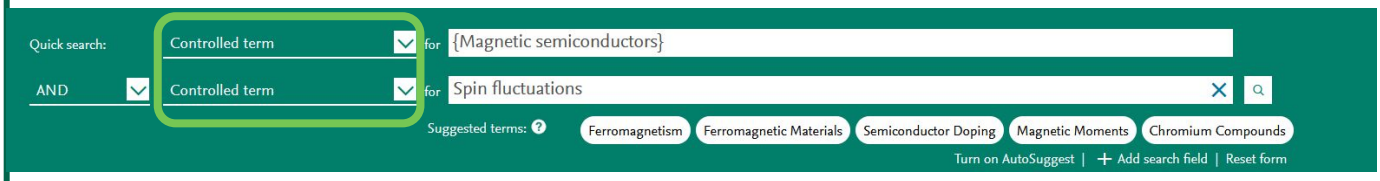
Uncontrolled terms: Antiferromagnetic **semiconductors** - Bohr magnetons - Ferromagnetic **semiconductor** - Intrinsic magnetic **semiconductors** - Photo-induced - Photoinduced spin - Single photons - Temperature intervals

Classification code: 701.2 Magnetism: Basic Concepts and Phenomena - 708.4 Magnetic Materials - 922.2 Mathematical Statistics - 931.3 Atomic and Molecular Physics - 932.1 High Energy Physics - 933.1.1 Crystal Lattice

Main Heading: Defines the overall scope of document
Controlled Terms: Subject Headings assigned by Engineering Village editors.
Uncontrolled Terms: A collection of keywords derived from the original document
Classification Codes: retrieve results for very broad subject searching

Click any term that matches your topic. The **Controlled Terms** are the best option as they will return the most results since they are official terms used by the database.

In the results screen, the search box will update to search for your chosen term. You could add additional terms by adding more search fields, typing the terms in and selecting the term option.



Keep in mind that the more you use, the more it will limit results.